## The Design and Computation in Acoustics and Biomechanics

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## Abstract

There are many different devices with different mechanisms and for different purposes. Design and computation play a key role to ensure the device can function well and has good reliability and fatigue resistance. In our team we focus on the study of acoustical devices and biomedical devices. While the research for vibro-acoustics in our team was initiated in 1989 with a Computational Acoustics Programme (CAP) funded by government, the research for biomedical devices began in 2010 with funds both from Agency for Science Technology and Research (A\*STAR), then National Medical Research Council (NMRC), and the latest from Singapore-China Joint Research Programme. Much progress has been made in developing acoustic devices (such as mufflers, ventilation windows, noise barriers) and biomedical devices (carotid stents, stent-grafts, mitral heart valved stents). Here I will share the funded research and especially highlight the modelling and simulation work for selected topics. The use of metamaterials for noise reduction and vascular stent is also discussed.

Keywords: Acoustic devices, medical devices, modelling and simulation, computational acoustics, biomechanics